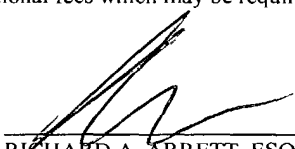


JC07 Rec'd PCT/PTO 11 MAR 2002

FORM PTO-1390 (REV 10-94)		U.S. Dept. of Commerce and Patent and Trademark Office	ATTORNEY'S DOCKET NUMBER: H01.2-10436
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known): 10/070863
INTERNATIONAL APPLICATION NO.: PCT/EP00/09118	INTERNATIONAL FILING DATE (14.09.00): 14 September 2000	PRIORITY DATE CLAIMED (dd/mm/yy): 14 September 1999 (14.09.99)	
TITLE OF INVENTION: FIXATION SYSTEM FOR BONES			
APPLICANT(S) FOR DO/EO/US: Dietmar Wolter; Uwe Schumann, Klaus Seide			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
1.	<input checked="" type="checkbox"/>	This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.	
2.	<input type="checkbox"/>	This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.	
3.	<input checked="" type="checkbox"/>	This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).	
4.	<input checked="" type="checkbox"/>	A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.	
5.	<input checked="" type="checkbox"/>	A copy of the International Application as filed (35 U.S.C. 371(c)(2))	
	a.	<input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International bureau).	
	b.	<input checked="" type="checkbox"/> has been transmitted by the International Bureau.	
	c.	<input type="checkbox"/> is not required, as the application was filed in the United States receiving Office (RO/US).	
6.	<input checked="" type="checkbox"/>	A translation of the International Application into English (35 U.S.C. 371 (c)(2)).	
7.	<input checked="" type="checkbox"/>	Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))	
	a.	<input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).	
	b.	<input checked="" type="checkbox"/> have been transmitted by the International Bureau.	
	c.	<input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.	
	d.	<input type="checkbox"/> have not been made and will not be made.	
8.	<input checked="" type="checkbox"/>	A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).	
9.	<input type="checkbox"/>	An oath or declaration of the inventor (35 U.S.C. 371(c)(4)).	
10.	<input type="checkbox"/>	A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).	
Items 11. to 16. below concern other document(s) or information included:			
11.	<input type="checkbox"/>	An Information Disclosure Statement under 37 CFR 1.97 and 1.98.	
12.	<input type="checkbox"/>	An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.29 and 3.31 is included.	
13.	<input type="checkbox"/>	A FIRST preliminary amendment. Please enter the amendment before fee calculation.	
	<input type="checkbox"/>	A SECOND or SUBSEQUENT preliminary amendment	
14.	<input type="checkbox"/>	A substitute specification.	
15.	<input type="checkbox"/>	A change of power of attorney and/or address letter.	
16.	<input type="checkbox"/>	Other items or information:	

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17. <input type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(A)(1)-(5)): <i>(select the appropriate one of the following fees)</i> Search Report has been prepared by the EPO or JPO \$ 930.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) \$ 490.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$ 750.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$ 1,070.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Articles 33(2)-33(4) \$ 98.00 ENTER APPROPRIATE BASIC FEE AMOUNT =	CALCULATIONS \$ 930.00	PTO USE ONLY			
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).					
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	9 - 20 =		x \$ 22.00	\$	
Independent Claims	2 - 3 =		x \$ 82.00	\$	
Multiple Dependent Claims (if applicable)			+ \$ 270.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$930.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must be filed also. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED =				\$930.00	
				Amount to be: Refunded	\$
				Charged	\$
a. <input checked="" type="checkbox"/> A check in the amount of <u>\$930.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees is enclosed. A duplicate copy of this sheet is enclosed. c. <input type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 22-0350.					
Send All Correspondence To: Vidas, Arrett & Steinkraus, P.A. Suite 2000 6109 Blue Circle Drive Minnetonka, MN 55343-9185 Telephone: (952) 563-3000 Facsimile: (952) 563-3001			By:  RICHARD A. ARRETT, ESQ. Registration No. 33,153		

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FIXATION SYSTEM FOR BONES

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

10 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

Not Applicable

BACKGROUND OF INVENTION

15 The invention relates to a fixation system for bones with a force support having holes and bone screws which are insertable into the holes.

If fragments of broken bones have to be joined to each other plate, nail and fixateur systems are available nowadays. Stability in plate and nail systems has been reached hitherto by the fact that if osteosynthetic plates were used bone screws firmly pulled these plates up to the bones in order to achieve a stabilization of the fragments of broken bones by means of the contact pressure which the plate exerts on the bones. If a marrow nail is used which is in the marrow space stability will also be increased by transversely inserting screws through the bone and the marrow nail. Although these screws are located in the bone by a thread minor motions are possible because the screw passes through the nail.

25 Different technical solutions were successful in fixedly joining the head of the screw to the plate or to establish a fixed connection between the screw and the marrow nail itself. In this respect, reference is made to EP 0 201 024 B1, DE 43 43 117 A1, DE 196 29 011 A1, and the German Patent Application P 198 58 889.5.

30 Hence, it is proper to speak of inner fixateur systems in this new generation of implants because the main feature of the outer fixateurs is angular stability between the screw and the transverse force support.

In clinical applications, these fixateur systems have distinctly exhibited a superiority over conventional plate and nail systems up to now.

5 Holes are oriented perpendicularly to the force support in known fixation systems.

 However, if the patient loads the implant with too much of his body weight too early, which is contrary to a doctor's advice, the implant might be spoiled by bending or the implant might break.

10 It has been observed that if bones are soft and/or are subjected to high loads, particularly by bending, the screws might be torn out of the bone.

 FR-A-742 618 discloses obliquely oriented holes in connecting pieces for osteosynthesis. The holes have threads the thread axis of which exactly coincides with the hole axis. Moreover, the connecting pieces have a thickened material region
15 adjacent to the holes. The consequence is that the bone screws can only be inserted in an exactly coaxial relationship with the hole axis. As a result, only unidirectional stability is achieved and the implant involves expenditure in manufacture.

 More implants having obliquely directed holes and unidirectionally insertable bone screws have been known from US-A-5 306 275, US-A-5 147 361,
20 and US-A-558 674.

 Accordingly, it is the object of the invention to provide a fixation system for bones which allows to simplify its manufacturing technique and to introduce bone screws in an optimal angular orientation in the bones.

25 BRIEF SUMMARY OF THE INVENTION

 The invention relies on the surprising finding that there are optimal positions of the bone screws depending on the bone region in order to make the anchoring of the force support, which can particularly be an implant, as favourable as possible in the bone. First and foremost, the positions concerned are those in
30 which the bone screws would exhibit an oblique orientation to the force support or to that portion of the force support which substantially extends in parallel with the bone or bone region in which the bone screw is desired to be anchored. Therefore, the fixation system for bones having a force support with holes and with bone

5 screws adapted to be inserted into the holes have at least one hole which is oriented obliquely to the force support. This means that the hole has a hole axis which is obliquely oriented at least to that portion of the force support through which the hole extends. As a result, a bone screw inserted into the hole may be given an optimal position in the bone region associated therewith. In addition or instead, the fixation
10 system may have at least one hole oriented perpendicularly to the force support, but particular measures which will be explained below still enable a bone screw to be oriented obliquely to the force support in this hole. The advantages of the invention are particularly conspicuous in the bone regions close to the joint. As a rule, the bone is widened here. An insertion of the bone screws which is oblique to the force
15 support will cause a more favourable fixation here. A better load transfer and stabilization of the fragments of broken bones will be achieved altogether. This can also have an effect as a reduced load acting on the fixation system and help avoid its distortion or breakage.

Basically, it is possible for the fixation system to have at least one hole
20 which is oriented obliquely to the force support and at least one hole which is oriented perpendicularly to the force support in a conventional manner. However, all of the holes may be in an oblique orientation to the force support as well. The hole axes of the various holes may be at different angles to the force support here. Further, all of the holes can be oriented perpendicularly to the force support.

25 It is particularly advantageous to join the bone screw and force support in an angularly stable fashion.

According to a solution, at least one hole has at least one element which is deformable by turning in a bone screw and which extends approximately in a plane oriented obliquely to the hole axis of the hole. The deformable element, in
30 particular, may be a lip, a ridge, an edge or a thread as above. In particular, the element concerned can also be hole oriented obliquely to the force support. For example, it will then be possible to achieve particularly small angles between the bone screw and the force support. However, the bone may also be a hole oriented

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5 perpendicularly to the force support. The oblique orientation of the deformable element will then allow to fix a bone screw in an oblique orientation to the force support also in such a hole. The orientability of the bone screw required to be secured here by an appropriate configuration of the hole.

10 According to a further solution, at least one hole has a thread for turning in a bone screw the thread axis of which is oriented obliquely to the hole axis. This makes it possible again, for example, for holes oriented obliquely to the force support to achieve a particularly small angle of the bone screw towards the force support. In contrast, if the hole is oriented perpendicularly to the force support a position of the bone screw which is optimally oblique can be achieved in the bone.

15 To achieve a screwed joint which is angularly stable, a deformable element or a thread may also be on the bone screw, i.e. in addition to the arrangement in the hole according to one of the above aspects a or also in lieu of it.

20 All of the angularly stable joints mentioned above can have the deformable element or thread formed, for example, in a hole which expands conically or spherically or a portion thereof and/or at the underside of a screw head of the bone screw which is to be inserted into the hole. If the hole has an adjoining cylindrical portion the diameter thereof may be dimensioned such that it allows to obliquely orient a shank of the bone screw therein. This also applies to the solutions and aspects which follow.

25 As far as the angularly stable joints have a deformable element these allow to turn in the bone screw at different angular positions with respect to the force support. This can be utilized, in particular, for a precise adjustment of the bone screw in the bone. This will be dealt with later below.

30 One aspect is based on the surprising finding that bone screws are susceptible to extraction particularly if they are introduced into the bone in parallel with each other. To avoid such exiting from the bone, at least two holes are made into the force support which are not in parallel with each other, but are obliquely inclined towards each other. In exchange, at least one hole may be obliquely inclined towards the

The bone screws are adapted to be inserted into the holes of the force support under different angles and to be fixed therein. The force support and the screws can be configured here according to the patent applications mentioned at the beginning, particularly according to DE 43 43 117 A1, DE 196 29 011 A1 or P 198 58 889.5. In particular, the fixation of the screws at different angles in the force support may be served by a deformable element which is located in the hole and/or on the screw and which may be a ridge, a lip, an edge or a thread. While the bone screw is turned into the hole with the material experiencing deformation it is possible to achieve different angular orientations of the bone screw in the force support. At this stage, for example, orientability can be achieved within a range of angles of from 10° to 15° with respect to the hole axis. Even higher angle degrees are achievable with the expenditure for material deformation, however, being larger. An optimized

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5 orientation of the hole or the element to be deformed which is predetermined already
may make it easier for the operator to bring the screw to an optimal position without
deforming a lot of material in the bone hole.

If at least two holes in the force support are inclined obliquely to each other
it is possible, from the very beginning, to insert at least two bone screws into the
10 force support in a position inclined to each other without using up the clearance
provided by the fixability under different angles. This significantly improves the
possible ways to make the screws straddle in the bone because of an inclined
position.

The fixation system may specifically be a bone plate, a bone nail or a fi-
15 xateur in the two solutions.

The oblique orientation of the hole or the deformable element or the thread
with respect to the force support specifically allows to avoid extracting or damaging
the implant when under an excessive stress.

20 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The invention will now be explained in greater detail with reference to the
accompanying drawings of embodiments. In the drawings:

Fig. 1 shows a bone plate on a tibia bone close to a joint in a plan view;

Fig. 2 shows a bone plate having a perpendicular hole and two obliquely
25 oriented holes at the central portion of a tubular bone in a longitudinal section;

Fig. 3 shows a curved bone plate on a tibia bone close to a joint in a partial
longitudinal section;

Fig. 4 shows a bone plate having a perpendicularly oriented hole and a
deformable element in an obliquely oriented plane in a perspective portion;

30 Fig. 5 shows a bone plate having an obliquely oriented hole and a preformed
thread in a perspective partial portion.

5 DETAILED DESCRIPTION OF THE INVENTION

While this invention may be embodied in many different forms, there are described in detail herein a specific preferred embodiment of the invention. This description is an exemplification of the principles of the invention and is not intended to limit the invention to the particular embodiment illustrated.

10 According to Fig. 1, a substantially T-shaped bone plate 1 substantially has three holes 2, 3, 4 in the elongate portion and has two more holes 5, 6 in a short, transversely oriented portion. The holes 2 to 6 have a hole axis each which is disposed obliquely to that portion of the bone plate 1 in which the respective hole 2 to 6 is located. If a bone plate 1 is completely level each hole 2 to 6 has a certain
15 oblique orientation to the plane through the entire bone plate 1.

The holes 2 to 6 has inserted therein bone screws 7, 8, 9, 10, 11 the orientation of which matches to the orientations of the holes 2 to 6. This optimally orients the bone screws 7 to 11 to those regions of a tibia bone 12 into which they need to be turned.

20 The bone screws 7 to 11 engage their screw heads with the holes 2 to 6.

Fig. 2 shows a bone plate 13 where the middle hole 14 has conventionally oriented its hole axis 15 perpendicularly to the bone plate 13. As a result, a bone screw turned into the hole 14 will always be turned perpendicularly into a tubular bone 16 which is located below.

25 However, the two outer holes 17, 18 of the bone plate 13 have their axes 19, 20 oriented at an acute angle towards the bone plate 13. The result is that bone screws to be turned into the two outer holes 17, 18 will caused to straddle in the adjoining bone 16, thus securely fixing the bone plate 13.

Moreover, all of the holes 14, 17, 18 have an element 21, 22, 23 to fix a bone
30 screw, which can be configured as a deformable ridge or lip or edge or as a preformed thread (deformable or not), in an angularly stable fashion. In the example, the element 21, 22, 23 for an angularly stable fixation is disposed in a plane oriented perpendicularly to the hole axis 15, 19, 20 provided that the element 21, 22, 23

5 concerned is a ridge, a lip or an edge. In case that the element 21, 22, 23 concerned is a thread its axis coincides with the hole axis 15, 19, 20.

If the element 21, 22, 23 for an angularly stable fixation of the bone screws is of a deformable design there is an additional possibility to fix the bone screws in the holes 14, 17, 18 at different orientations with regard to the hole axes 15, 19, 20. To
10 this effect, the bone screws have their screw heads inserted into the holes, 14, 17, 18 with threads at the undersides of the screw heads interacting with the deformable elements 21, 22, 23.

In Fig. 3, a bone plate 24 has been deformed by undergoing bending so as to fit well to the joint region of a tibia bone 25. It has holes 26, 27. There can be more
15 holes on the cut-away part of the bone plate 24. The axis of the hole 26 is oriented perpendicularly to the bone plate 24. The axis of the hole 27 is inclined, from the very beginning, with respect to the bone plate 24 or its support area on the bone 25. To this effect, the axis of the hole 27 is shaped so as to provide an oblique orientation of the axes of holes 26, 27 towards each upon conformation of the bone
20 plate 24 to the bone 25. The result is that the screws which were turned in will straddle in the bone 25, which counteracts the bone plate 24 being torn out of the bone 25.

In Fig. 3, the holes 26, 27 of the bone plate 24 are provided with a circumferential ridge 28, 29 at their inner periphery. A bone screw having a thread at
25 the underside of its head may be turned into this ridge 28, 29, which causes a deformation of the ridge 28, 29 depending on the angle at which the bone screw is turned in with respect to the axis of the hole 26, 27. In addition, while the ridge or the thread of the screw undergoes deformation the screw is secured in its turned-in position in the bone. The pre-planned oblique position of the axes of holes 26, 27
30 with respect to each other allows to inclinedly orient the bone screws towards each other without using up the clearance existing for fixability under different angles in the bone plate 24. Thus, what is simultaneously achieved are a straddled position

5 What is claimed is:

1. A fixation system for bones with a force support (1, 13, 24) having holes (2 to 6; 14, 17, 18; 26, 27) and bone screws (7 to 11) adapted to be inserted into the holes, characterized in that at least one hole has an element deformable by turning in a bone screw which is selected from a ridge, lip or edge and which extends in a plane oriented obliquely to the hole axis of the hole.
10
2. A fixation system for bones with a force support (1, 13, 24) having holes (2 to 6; 14, 17, 18; 26, 27) and bone screws (7 to 11) adapted to be inserted into the holes, characterized in that at least one hole has a thread for turning in a bone screw the thread axis of which is oriented obliquely to the hole axis of the hole.
15
3. The fixation system according to claim 1, characterized in that at least one hole (31) is oriented perpendicularly to the force support (30).
20
4. The fixation system according to claim 1, characterized in that at least one hole (2 to 6; 17, 18; 27) is oriented obliquely to the force support (1, 13, 24).
25
5. The fixation system according to claim 1, characterized in that at least two holes (17, 18; 26, 27) are oriented obliquely towards each other.
6. The fixation system according to claim 5, characterized in that the axes of the two holes (17, 18; 26, 27) diverge on the side of the force support (16, 25) which is to face the bone (16, 25).
30
7. The fixation system according to claim 1, characterized in that the force support (24) is formed according to the surface of an area of a bone (25) or is conformable to such a surface.

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- 5 8. The fixation system according to claim 1, characterized in that a deformable
element (21, 22 23; 28, 29; 32) selected from a ridge, lip or edge or a
deformable portion of at least one hole (14, 17, 18; 26, 27; 31) of the force
support (13, 24, 30) and a screw head and/or another portion of the bone screw
exhibit materials of different degrees of hardness.
- 10
9. The fixation system according to claim 1 wherein the force support (1, 13, 24,
30, 33) is a bone plate, a bone nail or a fixateur.

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5

Abstract of the Disclosure

FIXATION SYSTEM FOR BONES

- 10 A fixation system for bones with a force support having holes and bone screws adapted to be inserted into the holes where at least one hole is oriented obliquely to the force support.

Fig. 1

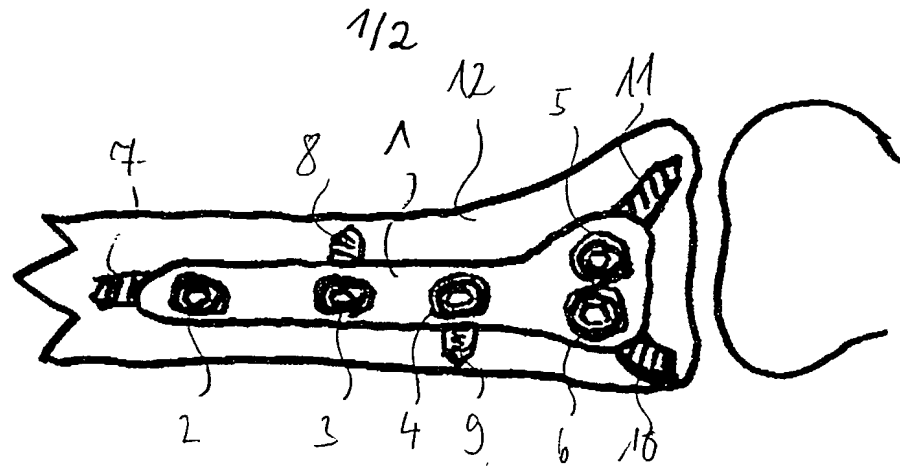


Fig. 2

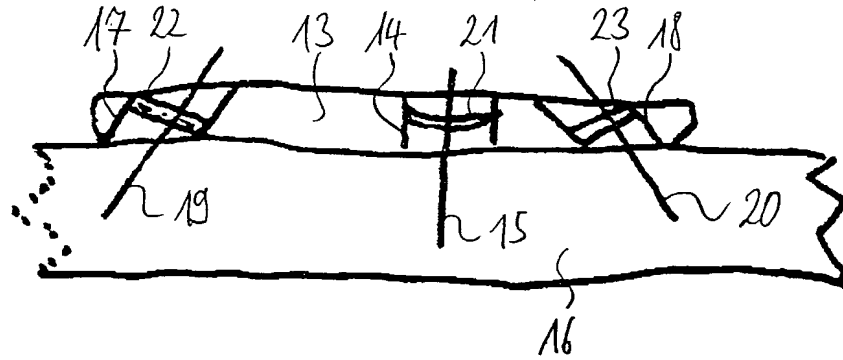
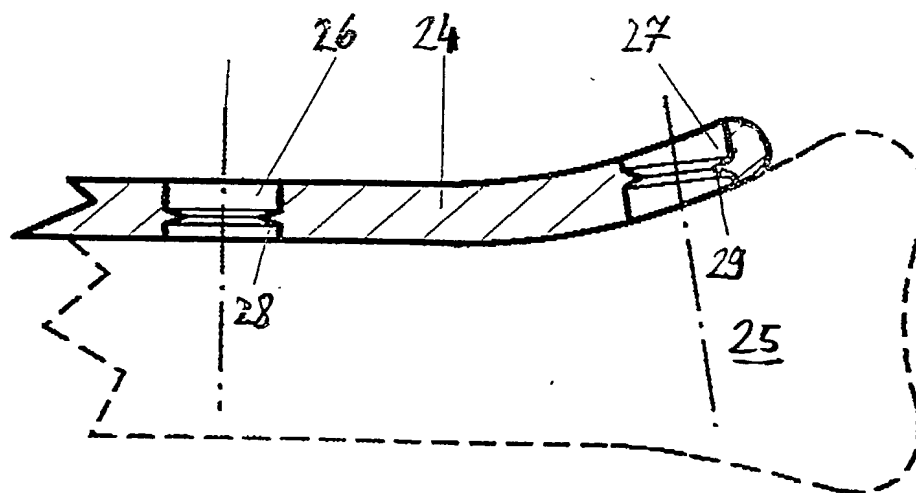


Fig. 3



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Fig. 4

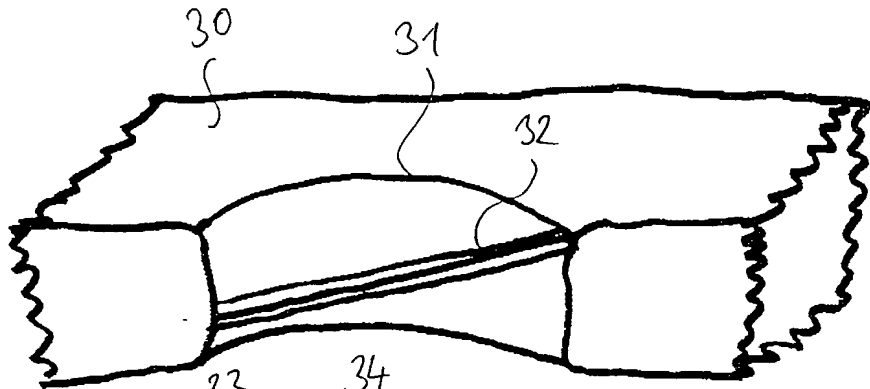
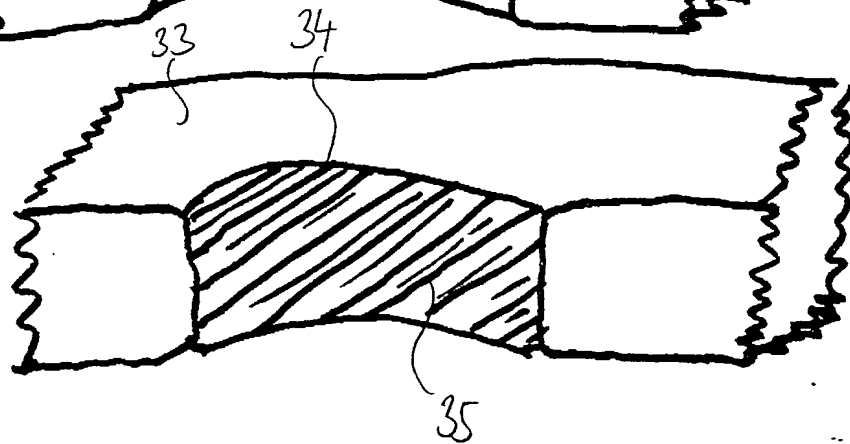


Fig. 5



10070863 070802

PATENT/DESIGN PATENT

DECLARATION

As a below-named inventor, I(we) hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name,

I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

FIXATION SYSTEM FOR BONES

filed on **March 11, 2002** under Ser. No. **10/070863**.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to in the declaration.

I acknowledge the duty to disclose all information which is known to be material to patentability of this application in accordance with Title 37, Code of Federal Regulations §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119, of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:
(List prior foreign applications)

COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
DE	199 43 924.9	14/09/1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
DE	199 62 317.1	23/12/1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

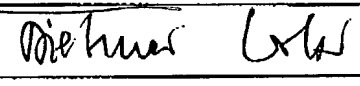
Telephone calls and correspondence should be directed to:

VIDAS, ARRETT & STEINKRAUS
Customer # 490

Sole or First Inventor**Second Inventor**

Full Name: **Dietmar Wolter**

Full Name: _____

Inventor's
Signature: 

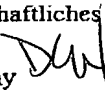
Inventor's
Signature: _____

Date: **1.7.02**

Date: _____

Citizenship: **DE**

Citizenship: _____

Post Office Address: **c/o Berufsgenossenschaftliches
Unfallkrankenhaus
Bergedorfer Strasse 10
D-21033 Hamburg, Germany** 

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Address: _____

Residence:
(if different
from post
office address)

Residence:
(if different
from post
office address)

(Attach additional sheets for third and subsequent inventors)

2002 JUL 05 12:08

PATENT/DESIGN PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Dietmar Wolter)	POWER OF ATTORNEY FROM INVENTOR(S)
)	
Title:	Fixation System for Bones)	
)	
Filed:	on March 11, 2002)	
	Appl. No. <u>10/070863</u>)	

Docket No.: H01.2-10436

Commissioner for Patents
Washington, DC 20231

As a below named inventor of the subject matter of the above identified patent application, I hereby appoint the following attorneys to insert the docket no., filing date and application number of said application above when known; to prosecute this application and any application claiming priority therefrom; to execute any terminal disclaimers on behalf of assignee; and to transact all business in the Patent and Trademark Office connected therewith:

Richard A. Arrett	Reg. No. 33,153
Oliver F. Arrett	Reg. No. 22,117
Scott Q. Vidas	Reg. No. 30,812
Walter J. Steinkraus	Reg. No. 29,592
Jane H. Arrett	Reg. No. 33,355
William E. Anderson, II	Reg. No. 37,766
Jonathan Grad	Reg. No. 41,795
Lisa L. Ryan-Lindquist	Reg. No. 43,071
Edwin E. Voigt, II	Reg. No. 36,042
James M. Urzedowski	Reg. No. P-48,596
Robert O. Vidas	Reg. No. 20,164

all of VIDAS, ARRETT & STEINKRAUS, Customer # 490, and I hereby authorize them to act and rely on instructions from, and to communicate directly with, the firm or person which sent this case to VIDAS, ARRETT & STEINKRAUS unless or until I instruct VIDAS, ARRETT & STEINKRAUS in writing to the contrary.

Dated this 17 day of July, 2002.

(First inventor's signature)

(First inventor's name)

Dietmar Wolter

(Attach additional sheet with name(s) and signature(s) of fourth and subsequent inventors)
(Filing date, application number and docket number may be left blank at time of signing)

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